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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/707,710
Filing Date: November 07, 2000
Appellant(s): KORN ET AL.

J. Grant Houston
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/03/2004 appealing from the Office action mailed 05/18/2004.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,673,244	MILES	6-1987
6,340,831	KUHARA	1-2002
6,345,059	FLANDERS	2-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 6-8 and 10-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miles (U.S. Patent No. 4,673,244) in view of Kuhara et al., (6,340,831 from hereinafter "Kuhara"), and further in view of Flanders (U.S. Patent No. 6,345,059).

As to claims 6-8, 10, 12-13, and 16-19, Miles discloses a process for manufacturing a semiconductor laser that requires installing the chip (Fig. 4, ref. 120) in a package, inserting and securing a polarization-maintaining optical fiber through the

ferrule and feedthrough (col. 3, lines 41-43), aligning the endface to the energized semiconductor chip (col. 4, lines 4-6) and detecting the polarization extinction ratio (PER) of light transmitted through the fiber from the semiconductor chip (Fig. 3), and then axially rotating the endface of the fiber to maximize the PER through detection on a slow or fast path or axis (Fig. 3). Miles also teaches a process of securing the fiber on the mounting structure by sealing around the fiber, before or after axial rotation adjustments (col. 5, lines 39-51). Miles also teaches the use of a mounting structure to improve the PER (Fig. 3).

However, Miles fails to specifically disclose installing a semiconductor chip in a package on a bench and securing an endface of the optical fiber to the bench and the reference also does not specifically teach a mounting structure that is deformable.

Kuhara discloses semiconductor laser (Fig. 18, ref. 70) with a semiconductor chip (col. 15, lines 61-66) on a bench (Fig. 18, ref. 98) and securing an endface of the optical fiber (Fig. 18, ref. 91) to the bench (col. 16, lines 1-2).

Flanders discloses a semiconductor laser (abstract) having a deformable mounting structure (col. 4, lines 41-44) that enables active and passive alignment during system manufacture or calibration after an in-service period (col. 4, lines 41-44).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have installed a semiconductor chip in a package on a bench and securing an endface of the optical fiber to the bench since one would be motivated to create a laser that is similar in size and subsequently cheaper to manufacture (col. 16, lines 5-9). Moreover, such a method produces a device that is more suitable for long

distance communication (col. 6, lines 33-35), has lower optical loss (col. 6, lines 35-38), and has easier handling for optical transmission (col. 8, lines 8-12).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have used a deformable mounting structure since one would be motivated to further maximize PER during the process of manufacture of the semiconductor laser device (col. 4, lines 41-44). A deforming structure allows fibers that are already aligned and secured to be readjusted so that PER can be enhanced until a desired ratio level is reached (col. 4, lines 41-44). And this is important because, according to Miles, the level of optimally desired PER relates directly to the quality of the laser light that will emerge from the fiber. If the PER is optimized, even when the fiber is shortened, the light that is outputted will be high quality, linearly polarized light that is independent of fiber length and is therefore, highly useful for designed application (col. 5, lines 52-62).

As to claims 11, 14, and 15, Miles discloses a process for manufacturing a semiconductor laser as recited above, however, the references fails to specifically disclose plastically deforming a mounting structure to which the fiber endface is secured and where axial fiber rotation and PER maximization can be performed (Fig. 3).

Flanders discloses a semiconductor laser (abstract) having a deformable mounting structure (col. 4, lines 41-44) that enables active and passive alignment during system manufacture or calibration after an in-service period (col. 4, lines 41-44).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have used a deformable mounting structure since one would be

motivated to further maximize PER during the process of manufacture of the semiconductor laser device (col. 4, lines 41-44). A deforming structure allows fibers that are already aligned and secured to be readjusted so that PER can be enhanced until a desired ratio level is reached (col. 4, lines 41-44). And this is important because, according to Miles the level of optimally desired PER relates directly to the quality of the laser light that will emerge from the fiber. If the PER is optimized, even when the fiber is shortened, the light that is outputted will be high quality, linearly polarized light that is independent of fiber length and is therefore, highly useful for designed application (col. 5, lines 52-62).

(10) Response to Argument

Appellant's main argument is that none of the cited prior art references, alone or in combination, teach or suggest the step of Appellant's Claim 6 of "axially rotating the endface of the fiber relative to the bench to improve the polarization extinction ratio by deforming the mounting structure" performed after the step of "securing an endface of the optical fiber to the bench to receive light generated by the semiconductor chip using a mounting structure." In particular, Appellant argues that the Miles Patent "teaches away" from the invention claimed by Appellants in Claim 6.

Appellant argues that each of the references in the combination proposed in the Office Action "teaches away" from their combination. However, Examiner disagree and will address the arguments to each of the references below.

As to Miles reference, Appellant argues that "after the bonding is set, the fiber is no longer adjusted" and therefore presumes that "in some sense, the Miles Patent

teaches away from the invention as claimed." While the Examiner agrees that after the bonding is set, the fiber is no longer adjusted, Examiner asserts that nowhere is this found in the claims. In fact, there is no mention of any type of bonding. The claims merely recites the step of "securing" and endface of the fiber to bench and then "after the step of securing" is the PER detected. Because neither the language of the claims nor the specification teach about any type of bonding, Examiner sees no reason how the Miles reference teaches away. The Miles reference clearly discloses inserting and securing a polarization-maintaining optical fiber through the ferrule and feedthrough (col. 3, lines 41-51), aligning the endface to the energized semiconductor chip (col. 4, lines 4-6) and detecting the polarization extinction ratio (PER) of light transmitted through the fiber from the semiconductor chip (Fig. 3), and then axially rotating the endface of the fiber to maximize PER through detection on a slow or fast path or axis (Fi.3, note the feedback loop to "rotate fiber"). Because the claims did not recite anything having to do with bonding, Examiner interpreted "the fiber end is placed in the ferrule .... That the center of the fiber and the ferrule coincide as nearly as possible, so that the movement of the fiber off center when the fiber is rotated is as small as possible" as reading on the claim language "securing". In fact, like that of Appellant's invention, the Miles references teaches even placing, or securing, the fiber in this manner "permits rotating and otherwise manipulating the fiber with lessened risk of distorting or damaging the fiber" (col. 3, lines 48-51). Therefore, just as Appellant admits, the Miles reference and Appellant's invention "both seek to improve rotation alignment between a fiber secured on a mount structure and a laser." As a result,

Examiner does not believe that the Miles reference teaches away from the claimed invention.

As to the Flanders reference, Appellant argues that the reference "does not contain any mentioning of polarization extinction ratio (PER)" nor does it show slow axial rotation of the fiber endface by a deforming structure. However, the Examiner disagrees. Examiner notes that the Flanders reference was combined with the Miles reference to render obvious the use of deformable mounting structure, and not for PER detection or the like. The reason is because the Miles reference, as discussed above, already teaches these elements. Clearly, the Flanders reference is of the same semiconductor art and so the only reason to combine the Flanders reference is to provide the use of deformable mounting structure. The Flanders reference clearly teaches the use of a deformable mounting structure (col. 4, lines 41-44) and provides more than sufficient motivation to combine in that it enables active and passive alignment during system manufacture or calibration after an in-service period (col. 4, lines 41-44). Moreover, this is important because if the PER of Miles is optimized, even when the fiber is shortened, the light that is outputted will be high quality, linearly polarized light that is independent of fiber length and is therefore, highly useful for designed applications (col. 5, lines 52-62).

As to Kuhara reference, Appellant argues that it does not show axially rotating the endface of the fiber relative to a bench to improve the PER by a deforming structure. However, Examiner disagrees. For the same reasons indicated for the use of Flanders reference, the Kuhara reference is important only for the step of installing a

semiconductor chip in a package on a bench and securing an endface of the optical fiber to the bench. Clearly, the Kuhara reference is of the same semiconductor art and discloses a semiconductor laser (Fig. 18, ref. 70) with a semiconductor chip (col. 15, lines 61-66) on a bench (Fig. 18, ref. 98) and securing an endface of the optical fiber (Fig. 18, ref. 91) to the bench (col. 16, lines 1-2). Moreover, the reference provides more than adequate motivation to combine the Miles reference to create a laser that is smaller in size and subsequently cheaper to manufacture (col. 16, lines 5-9) and providing that such a method produces a device that is more suitable for long distance communication (col. 6, lines 33-35), has lower optical loss (col. 6, lines 35-38), and has easier handling for optical transmission (col. 8, lines 8-12).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Tarifur R. Chowdhury
March 20, 2006

TARIFUR R. CHOWDHURY
PRIMARY EXAMINER

Conferees:

Frank Font

Georgia Y. Epps